

WHAT IS CLAIMED IS:

1. A method for monitoring a performance characteristic of a wheel of a mobile platform, the method comprising:

5 using rotation of the wheel during operation of the mobile platform to impart motion to an electric current generating device being carried on the wheel, to thus generate an electric current;

10 using said electric current to power a wheel performance characteristic sensor, that in turn senses a wheel performance characteristic and provides a real time signal indicative of the wheel performance characteristic;

communicating said signal via wireless signals to a receiver located on the mobile platform remotely from the wheel; and

15 using said wireless signals to communicate information specifically identifying said wheel from a larger plurality of said wheels, to said receiver.

2. The method of claim 1, wherein using rotation of the wheel to impart motion to an electric current generating device comprises using rotation of the wheel to impart motion to a permanent magnet generator supported on a hubcap associated with the wheel.

25 3. The method of claim 1, wherein communicating information specifically identifying said wheel comprises communicating information identifying a position of said wheel to thus associate said position of said wheel with said wheel performance characteristic.

30 4. The method of claim 1, further comprising storing the information identifying said wheel in said receiver.

5. The method of claim 1, further comprising storing the information identifying said wheel on a device in communication with said receiver.

5 6. The method of claim 1, further comprising displaying the wheel performance characteristic on a display viewable by an operator of the mobile platform.

10 7. The method of claim 1, further comprising displaying the information identifying said wheel and said wheel performance characteristic on a display viewable by an operator of the mobile platform.

8. A method for mapping and monitoring aircraft landing gear systems, said method comprising:

5 using the rotation of an aircraft landing gear wheel to drive a permanent magnet generator (PMG) mounted to a hubcap coupled to the landing gear wheel;

operating a wheel speed sensor, mounted to the hubcap, using a current output by the PMG;

10 communicating landing gear wheel rotational speed data, provided by the wheel speed sensor, to at least one remotely located transceiver using wireless signals;

acquiring mapping data pertaining to a positional location of a hubcap transceiver coupled to the hubcap with respect to other landing gear wheels within the landing gear utilizing the remotely located transceiver; and

storing the mapping data in the remotely located transceiver.

15 9. The method of Claim 8, wherein operating the wheel speed sensor using the current from the PMG comprises:

inputting the current output by the PMG to a power supply mounted to the hubcap; and

20 providing power output by the power supply to the wheel speed sensor and a hubcap transceiver mounted to the hubcap.

10. The method of Claim 9 where in providing power comprises utilizing power stored in at least one of a super-capacitor included in the power supply and a battery included in the power supply.

25 11. The method of Claim 9, wherein communicating landing gear wheel rotational speed data comprises:

communicating landing gear wheel speed data provided by the wheel speed sensor to the hubcap transceiver; and

using wireless signals to transmit the landing gear wheel speed data from the hubcap transceiver to the remotely located transceiver.

5 12. The method of Claim 9, wherein said method further comprises:

communicating tire pressure data, provided by a tire pressure sensor mounted to the landing gear wheel, to the hubcap transceiver; and

10 using wireless signals to transmit the tire pressure data from the hubcap transceiver to the remotely located transceiver.

13. The method of Claim 12, wherein communicating tire pressure data comprises operating the tire pressure sensor using as a power source at least one of a carrier wave transmitted by the hubcap transceiver and a battery included in the tire pressure sensor.

15 14. The method of Claim 8, wherein the method further comprises displaying the mapping data on a maintenance display terminal such that the positional location of the hubcap transceiver is illustrated.

20 15. The method of Claim 8, wherein the method further comprises displaying the landing gear wheel rotational speed data on a maintenance display terminal.

16. A method for mapping a location within an aircraft landing gear for each of a plurality of wireless landing gear monitoring systems, said method comprising:

5 mounting a hubcap transceiver included in each monitoring system to a respective one of a plurality of landing gear wheel hubcaps;

transmitting a wireless signal including a marker signal from the hubcap transceiver to at least one of a plurality of distant transceivers coupled to the aircraft;

10 acquiring mapping data pertaining to a positional location of at least one of the hubcap transceivers; and

displaying the mapping data on a maintenance display terminal such that the positional location of the hubcap transceiver is illustrated.

17. The method of Claim 16, wherein acquiring mapping data includes activating a mapping command utilizing the maintenance display terminal.

18. The method of Claim 17, where acquiring mapping data further includes selecting, using the maintenance display terminal, a specific landing gear monitoring system to be mapped.

20 19. The method of Claim 18, wherein acquiring mapping data further includes disrupting the wireless signal transmitted from the hubcap transceiver of the landing gear monitoring system selected to be mapped.

20. The method of Claim 19, wherein disrupting the wireless signal includes blocking the transmission of wireless signal to the distant transceiver.

25 21. The method of Claim 19, wherein acquiring mapping data further includes identifying the disrupted wireless signal using the distant transceiver.

22. The method of Claim 21, wherein acquiring mapping data further includes correlating the identified disrupted wireless signal and associated marker signal to the landing gear monitoring system selected to be mapped and storing data expressing the correlation in the distant transceiver.

5 23. The method of Claim 22, wherein acquiring mapping data further includes transmitting the correlation data from the distant transceiver to the maintenance display terminal.

24. The method of Claim 23 wherein acquiring mapping data further includes transmitting the correlation data from the distant transceiver to at
10 least one other distant transceiver and storing the information in the other distant transceiver.

25. The method of Claim 16, wherein the method further includes monitoring the operational status of the landing gear wheel associated with the selected monitoring system, via the maintenance display terminal.

26. A method for monitoring the operational status of a wheel assembly of a mobile platform, comprising:

using the rotation of a wheel of the wheel assembly to drive a permanent magnet generator (PMG) disposed on the wheel assembly;

5 using an output of the PMG to power a sensing device disposed on the wheel assembly, the sensing device sensing an operational parameter associated with the wheel assembly; and

10 transmitting, via wireless signals, information generated by the sensing device, to a remotely disposed wireless receiver carried on the mobile platform.

27. The method of Claim 26, wherein transmitting information comprises:

using the output of the PMG to power a wheel assembly wireless transceiver disposed on the wheel assembly,

15 communicating the operational parameter from the sensing device to the wheel assembly wireless transceiver; and

transmitting, via wireless signals, the information generated by the sensing device, from the wheel assembly wireless transceiver to the remotely disposed wireless transceiver.

20 28. The method of Claim 26, wherein said method further comprises:

acquiring mapping data pertaining to a positional location of the hubcap transceiver on the landing gear utilizing the distant transceiver; and

storing the mapping data in the distant transceiver.

29. The method of Claim 26, wherein the method further comprises displaying the information generated by the sensing device on a maintenance display terminal.

30. A method for mapping a location within an aircraft landing gear for each of a plurality of wireless landing gear monitoring systems, wherein each monitoring system is carried on a respective one of a plurality of landing gear wheel hubcaps, said method comprising:

5 transmitting a wireless signal including a marker signal from a hubcap transceiver included in each monitoring system to at least one of a plurality of remote transceivers coupled to the aircraft, wherein each marker signal contains a signal characteristic unique to the respective monitoring system from which it is transmitted;

10 activating a mapping command at a maintenance display terminal adapted to communicate with each remote transceiver;

selecting, using the maintenance display terminal, a specific landing gear monitoring system to be mapped;

15 disrupting the wireless signal transmitted from the hubcap transceiver of the landing gear monitoring system selected to be mapped;

identifying the disrupted wireless signal using the remote transceiver;

20 correlating the identified disrupted wireless signal and associated marker signal to the landing gear monitoring system selected to be mapped and storing data expressing the correlation in the remote transceiver;

transmitting the correlation data from the remote transceiver to the maintenance display terminal;

25 transmitting the correlation data from the remote transceiver to at least one other remote transceiver and storing the information in the other remote transceiver; and

monitoring the operational status of the landing gear wheel associated with the selected monitoring system, via the maintenance display terminal.